

XII.—*Contributions to the Botany of South America.*

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LIRIOSMA.

THIS genus, proposed by Pöppig, and figured in his 'Nov. Gen.' tab. 239, for a species found by him near the Rio Negro, in Brazilian Guiana, is yet but imperfectly known: its characters there given are in many respects incorrect or incomplete. That botanist referred it to *Olacaceæ*, it having been at first placed in *Styracææ* by Endlicher. Two other species were soon afterwards announced, for which another new genus, under the name of *Hypocarpus*, was proposed by Prof. A. DeCandolle, in his 'Prodr.' viii. 245, which he considered to be more related to *Styracææ*; but he was soon undeceived, as in the addenda to the same volume, p. 673, he recognised its identity with *Liriosma*. From a plant which I found near Rio de Janeiro in 1830, and which I then examined, I am enabled to complete the generic character, as far as regards the details of the fruit and seed, and at the same time, I now add my analysis of the floral structure of *L. Gardneriana*. Both Pöppig and DeCandolle describe the ovarium in this genus to be half imbedded in the adhering calyx; I find on the contrary that although the lower moiety of the ovarium is glabrous, and closely invested by the fleshy cup of the calyx, it is yet perfectly free from it, even for a considerable period after the fall of the corolla; the ovarium now increases more than the calyx, but at length the latter assumes the greatest increment, and at last wholly incloses it, becoming agglutinated with it, and converted into an enveloping pulp, leaving a small umbilical hollow in the summit and showing there the remains of its epigynous gland. The presence of a fleshy epigynous gland upon an inferior ovarium is a circumstance of the most ordinary occurrence, where it is held to be an abortive whorl of stamens; its existence upon a perfectly superior ovarium was therefore considered to be an impossibility, or when noticed it was always described as a mere basal enlargement of the style; but I have shown that in *Hyoscyamus* this anomaly really exists, and have since met with the same occurrence in several other instances. In the present case, its development is most decidedly marked, under the form of a prominent, rounded, fleshy disk, distinct in colour and texture, and exterior to the true pericarpial membranes. It is still more prominent in *Schöpfia*, and is found with a greater or less degree of development in most of the genera of the *Olacaceæ* and *Santalaceæ*. The internal structure of the ovarium accords with the character pointed out by Mr. Bentham, as a prominent feature of one of his tribes of the *Olacaceæ*,

where its central placentation divides at its base into pseudo-dissepiments, leaving the summit of the internal space always free and unilocular, and the ovules suspended in that free space from the common apex of these incomplete divisions. This structure is decidedly marked in *Liriosma*, where the ovarium is 3-locular at base, with one ovule in each half-cell, suspended from the internal angle of these incomplete divisions, and here the apices of the ovules, rising above the points of suspension, are seen connivent in the perfectly unilocular summit of the ovarium. Of these ovules, as in the *Olacaceæ* and *Santalaceæ*, only one is perfected in the fruit, which becomes an oval crimson-coloured drupe, containing a putamen covered by pulp and inclosing a single albuminous kernel that fills its cavity; this exhibits externally a distinct raphe-like thread, extending from the base to the summit, as if the seed were suspended by a funicular support; but it will be seen that this thread partakes in no degree of the character of a true raphe, but is merely the remains of the pseudo-dissepiments, extended with the growth of the seed, and forced into a groove formed by pressure along its sides, there being seen at its summit a small cruciform extremity, resulting from the abortive ovules, similar to the structure that forms so remarkable a character of the *Santalaceæ*, as first pointed out by Mr. Robert Brown. This same appearance is well defined, and a true explanation of its origin is given by Mr. Bentham, in his excellent memoir upon the *Olacaceæ*, in the 18th volume of the 'Linnæan Transactions': he had observed the same structure in the genera *Olax*, *Heisteria* and *Schöpfia*, but its true nature had been mistaken by other botanists. The development of the seed in *Liriosma* is therefore identical with that of *Schöpfia*, a genus referred by Mr. Brown to *Santalaceæ*, but which Mr. Bentham first placed among the *Olacaceæ* with great reason; and this proves that the views of the former, in regard to the close affinity existing between these families, are founded upon truth, and I will presently adduce other proofs of their validity. The stamens, both fertile and sterile, in *Liriosma*, in form and structure resemble those of *Olax*: and *L. Gardneriana* and the typical species have their three fertile stamens placed in an alternate position, between each second petal and their six sterile stamens, intermediate between them, which are of course placed opposite the six petals. With the exact number and position of the stamens in the other species we are not informed, but I believe that in this genus, as in *Olax*, the real normal number of petals is six, with six fertile and six sterile stamens, the former being always alternate with, the latter opposite to, the segments of the corolla.

The following is an amended generic character of *Liriosma*,

drawn up from my own observations; and after the enumeration of its species, I purpose subjoining some remarks upon the affinities of the order to which it belongs:—

LIRIOSMA, Pöpp. *Hypocarpus*, A. DC.—*Calyx* parvus, carnosus, cupuliformis, disco adnatus, margine libero, crenato, vel obsolete 5-dentato, augescens, et ad fructum demum coalitus, eum tegens. *Petala* 6, sæpe usque ad medium geminatim laxè connata, carnosà, æstivatione valvata, apice processibus totidem inflexa. *Stamina fertilia* 3, petalis alterna, dimidio breviora, et ante suturam cujusque paris sita, e margine disci cupuliformis orta; *filamenta* complanata, pilis longis cottoneis barbata, demum glabra, libera, vel ad petalàs imò sæpius laxè agglutinata, connectivo crasso lato continua; *antheræ* introrsæ, ovatæ, cordatæ, 4-lobæ, 4-loculares, 4-valves, valvarum margine alterutro vicissim dextrorsum et sinistrorsum intrinsecus soluto, hinc longitudinaliter dehiscentes. *Stamina sterilia* 6, petalis opposita, et vix longiora, filamenta carnosula, longè barbata, demum glabra, apice appendiciformia et bifurcata, laciniis subulatis, acutis, tenuioribus. *Pollen* subglobosum, vesiculis 3 æquidistantibus notatum, integumentis tenuissimis. *Discus* hypogynus, cupuliformis, carnosus, calyce brevior et eo adnatus, ad marginem liberum inflexum petalà et stamina suffulciens. *Ovarium* ovatum, per dimidium inferiorem disco circumdatum, et illic glabrum, primo omnino liberum, cito adnatum, superne conicum, glandula magna epigyna crassa carnosà pilosa undique tectum, imò dissepimentis incompletis 3-loculare, summo 1-loculare. *Ovula* 3, anatropa singulatim in loculis spurii sab axi placentifero centrali (cionospermio) suspensa, apicibus in loculi summo indiviso simul conniventia. *Stylus* simplex, inclusus. *Stigma* capitatum, sub-3-lobum. *Drupa* baccata, ovata, monosperma, calyce adnato tecta, apice umbilicata. *Putamen* subtenuè, coriaceum. *Semen* loculum implens, sulco longitudinali pro receptione raphes spurii (e cionospermio in filum extenso) impressum. *Integumentum* tenuissimum. *Embryo* in albumen dense carnosum infra apicem inclusus, brevis, *cotyledonibus* minutis, ovatis, compressis, *radicula* ovata, umbilico proxima, supera.—Frutices *Brasilienses*; folia alterna, breviter petiolata, ovata, integra (rarius subdentata?), punctata; racemi axillares, breves, pauciflori; flores parvi, pedicellati; pedicellis ebracteatis, articulatis; florum partes præmolles interdum sese laxè agglutinantes.

1. *Liriosma candida*, Pöpp. (Nov. Gen. iii. 33. tab. 239);—foliis ellipticis, utrinque acutis, obiter remoteque serratis, vel intererrimis, utrinque glaberrimis; racemis axillaribus, corym-

bosis, plurifloris, folio dimidio brevioribus, calyce petalisque lineari-lanceolatis, glabris, istis extus virenti-cinereis.—Prov. Rio Negro Brazilæ, circa fluv. Tefê, confluentem Amazonicum.

The leaves are described as being 5 inches long, 2 inches broad, the flowers supported by two bracts, the calyx obsolete denticulate, the petals thickened at their summit, 3-nerved, and coriaceous.

2. *Liriosma pauciflora*, A. DC. Prodr. viii. 673; Deless. Icon. Sel. v. 18. tab. 41. *Olox pauciflora*, *Bth. Linn. Trans.* xviii. 678; *Lond. Journ. Bot.* ii. 375. *Hypocarpus pauciflorus*, A. DC. Prodr. viii. 246;—foliis ovatis, obtusis, junioribus cum ramulis pedicellisque pubescentibus; pedunculo axillari brevi, 1-3-floro, et pedicellis calycibusque molliter puberulis.—Prov. Bahia ad Serra d'Acuruà; *v. s. in herb. Hook.* (Blanchet, n. 2795).

The above characters are wholly taken from the description of Mr. Bentham, who also states that the ovarium is adnate to the calyx; the lower half is without doubt subsequently so, by the intervention of the cupular disk, but I suspect that at an earlier stage it is entirely free from the disk, as occurs in *L. Gardneriana*: the upper uncovered moiety, as in that species, is covered with short erect hairs. The only specimens known were collected by Blanchet in the Serra d'Acuruà or Açuà,—the rich diamond district discovered a few years ago in the province of Bahia.

3. *Liriosma Gardneriana*, A. DC. Prodr. viii. 679. *Olox Gardnerianus*, *Bth. Lond. Journ. Bot.* ii. 375. *Hypocarpus Gardnerianus*, A. DC. *loc. cit.* viii. 216;—foliis lanceolato-oblongis vel ovato-oblongis, acuminatis, apice obtusiusculo, imo subrotundatis, textura teneris, ramulisque glabris; racemulo brevi 4-12-floro, pedicello pedicellisque pulverulentis, calyce petalisque extus glabris, ovario pubescente.—Prov. Ceará, Serra de Araripe, prope Bomjardim (Gardn. n. 1957).

This is a small tree about 12 feet high, with odoriferous flowers, and with leaves mostly 3 inches long, $1\frac{1}{4}$ in. broad, on a petiole of 2 or 3 lines; the petals are of a sulphur-yellow colour, linear, 3 lines long, thick, fleshy, and quite glabrous. The six sterile stamens are two-thirds the length of the petals, and are always placed opposite to them; the three fertile stamens are shorter, and situated at points between each second petal, and are therefore alternate with them; all the filaments are free above, but adhere at their base to the petals for the length of a quarter of a line, by which agglutination these are formed into three distinct bifid petals, cleft nearly to the base; but the fila-

ments are easily detached, and then the united petals separate of themselves, thus showing the corolla to be in no degree gamopetalous; the four anther-cells open by two longitudinal lines, as above described, and are filled with a number of pollen-grains, aggregated into a mass, by a quantity of loose yellowish grumous matter: the pollen-grains are roundish, with three globular equidistant, marginal vesicles, each terminated by a mammillary point; they are extremely thin in texture: all the filaments, both sterile and fertile, are covered with long white cottony hairs, which ultimately become glued to the petals. The ovarium is half immersed in the cupuliform disk; the exerted moiety is covered by the fleshy epigynous gland, which is hairy: before æstivation, the lower portion of the ovarium is quite free from the enveloping disk, but it soon becomes agglutinated to it, by the same mucilaginous exudation (probably evolved by the disk) that glues the base of the stamens to the petals: even after the ripening of the flower, the cupuliform disk is most easily separated from the ovarium, without the slightest rupture of the parts; but it cannot be torn away from the calyx without laceration.

4. *Liriosma Velloziana*, A. DC. Prodr. viii. 673. *Ola*x Velloziana, *Bth. Lond. Journ. Bot.* ii. 375;—ramulis glabris, foliis obovatis, acuminatis, et mucronulatis, basi obtusiusculis, reticulato-venosis, nervis divaricatis, utrinque glaberrimis, petiolo brevi, canaliculato; racemo brevi, axillari, 3-5-flo-ro; ovario pubescente; fructu ovali, incarnato, pulpa molli.—Rio de Janeiro.

The leaves are smaller than the last species, about 2 or $2\frac{1}{2}$ inches long, $1\frac{1}{4}$ inch broad, on a petiole 3 lines in length; they are acuminate from the middle of the leaf, and are more fleshy and opaque: the raceme is shorter; the drupe is oval, 9 lines long, 6 lines in diameter, polished, and of a light scarlet colour, with a circular brownish depression in the apex; it is soft and fleshy, inclosing a thin subosseous putamen; the details of the structure of its seed will be found in the following remarks on the affinities of the natural order to which it belongs*. This is a low growing tree, which I found in the wooded margins of the bay of Jurujuba; it is among Gardner's collection, no. 5380†.

* These will appear in the next Number of this Journal.

† A representation of this plant and an analysis of its fruit, together with the details of the floral structure of the preceding species, will be given in plate 3 of the 'Contributions to Botany,' &c.